



Distance sensor VDM28-8-L1-IO/115b/136



- Distance measurement using object
- Measuring method PRT (Pulse Ranging Technology)
- Accurate, clear, and reproducible measuring results
- Red laser as the light emitter
- Version with IO-Link interface
- Laser class 1, eyesafe

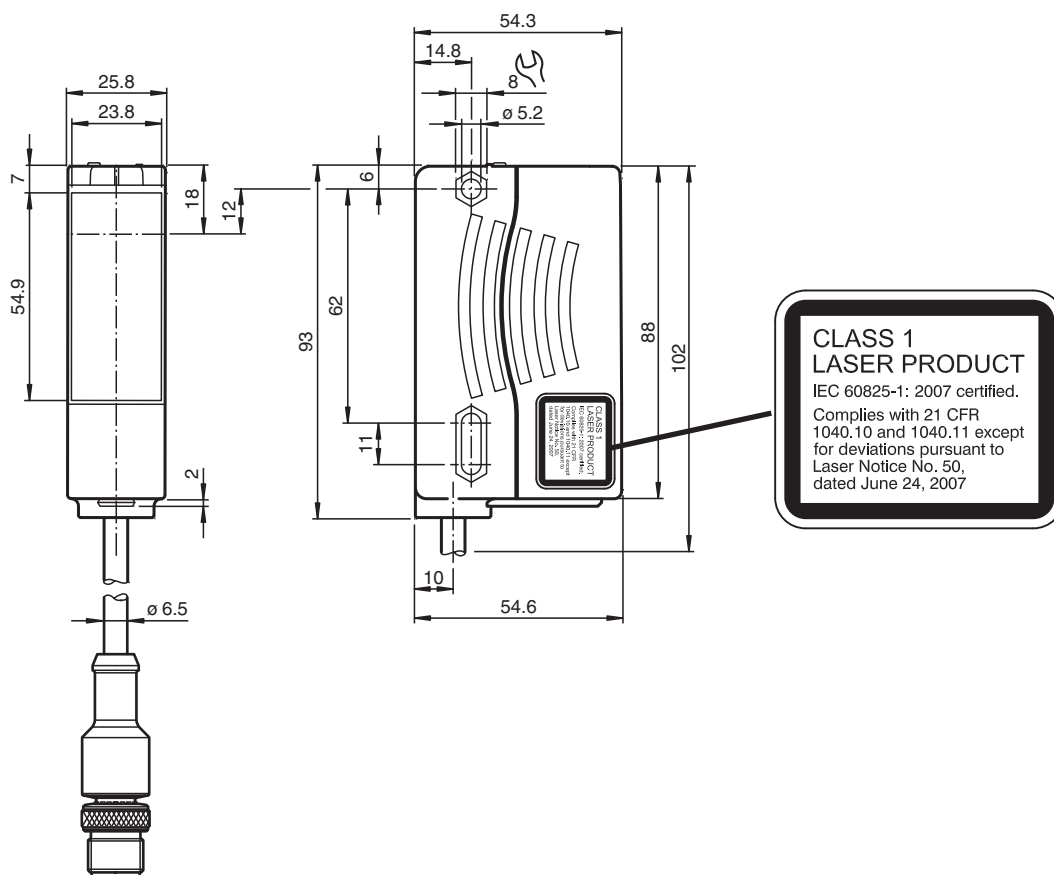
Universal distance sensor, measurement to object, IO-Link interface, measuring method PRT, 8 m detection range, red laser light, laser class 1, push-pull output, fixed cable with M12 plug



Function

The VDM28 distance measurement device employs Pulse Ranging Technology (PRT). It has a repeat accuracy of 5 mm with an operating range of 0.2 ... 50 m and an absolute accuracy of 25 mm.
The compact housing of the Series 28 photoelectric sensors, with dimensions of 88 mm (height), 26 mm (width) and 54 mm (depth), make it the smallest device available in its class.

Dimensions



Technical Data

General specifications

Measurement range	0.2 ... 8 m
Reference target	Kodak white (90%)
Light source	laser diode typ. service life 85,000 h at Ta = +25 °C
Light type	modulated visible red light
Laser nominal ratings	
Note	LASER LIGHT , DO NOT STARE INTO BEAM
Laser class	1
Wave length	660 nm
Beam divergence	< 1.5 mrad
Pulse length	approx. 4 ns
Repetition rate	250 kHz
max. pulse energy	< 1.5 nJ
Angle deviation	max. ± 2°
Measuring method	Pulse Ranging Technology (PRT)
Diameter of the light spot	< 10 mm at a distance of 8 m at 20 °C
Ambient light limit	50000 Lux
Temperature influence	typ. ≤ 0.25 mm/K

Functional safety related parameters

MTTF _d	200 a
Mission Time (T _M)	10 a
Diagnostic Coverage (DC)	0 %

Indicators/operating means

Operation indicator	LED green
Function indicator	2 LEDs yellow for switching state
Teach-In indicator	Teach-In: LED green/yellow equiphase flashing; 2.5 Hz Teach Error: LED green/yellow non equiphase flashing; 8.0 Hz
Control elements	5-step rotary switch for operating modes selection (threshold setting and operating modes)
Control elements	Switch for setting the threshold values

Electrical specifications

Operating voltage	U _B	10 ... 30 V DC / when operating in IO-Link mode: 18 ... 30 V
Ripple		10 % within the supply tolerance
No-load supply current	I ₀	≤ 70 mA / 24 V DC
Time delay before availability	t _v	1.5 s

Interface

Interface type	IO-Link
Protocol	IO-Link V1.0
Cycle time	min. 2.3 ms
Mode	COM2 (38.4 kBit/s)
Process data width	16 bit
SIO mode support	yes

Output

Signal output	2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected	
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Switching frequency	f	50 Hz
Response time		10 ms

Conformity

Electromagnetic compatibility	EN 61000-6-2, EN 61000-6-4
Laser safety	IEC 60825-1:2007

Measurement accuracy

Absolute accuracy	± 25 mm
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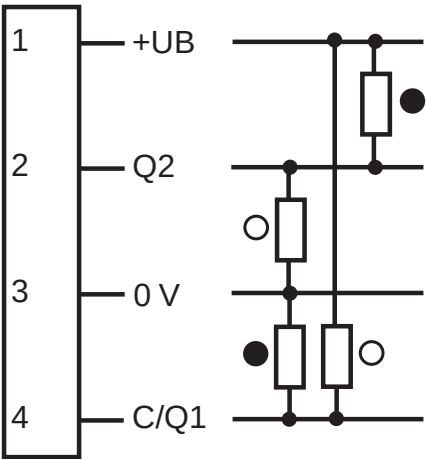
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Technical Data

Repeat accuracy		< 5 mm
Approvals and certificates		
Protection class		III
UL approval		cULus Listed, Class 2 Power Source, Type 1 enclosure
CCC approval		CCC approval / marking not required for products rated ≤36 V
FDA approval		IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
Ambient conditions		
Ambient temperature		-30 ... 55 °C (-22 ... 131 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		
Degree of protection		IP67
Connection		300 mm fixed cable with M12 x 1, 4-pin connector
Material		
Housing		Plastic ABS
Optical face		PMMA
Mass		90 g
Dimensions		
Height		88 mm
Width		25.8 mm
Depth		54.6 mm

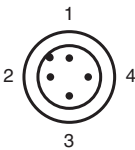
Connection Assignment

Option:



○ = Light on
● = Dark on

Connection Assignment



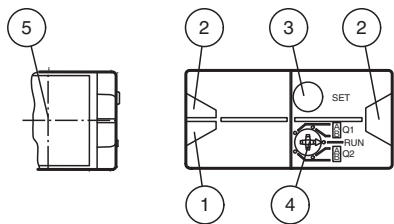
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Connection Assignment

Wire colors in accordance with EN 60947-5-2

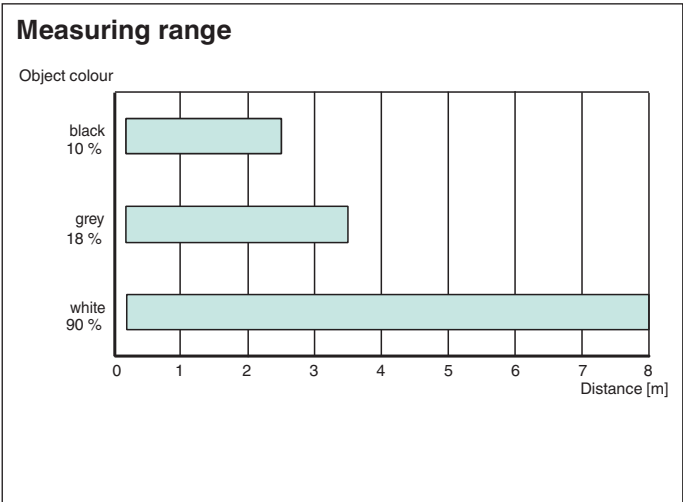
- 1 | BN (brown)
- 2 | WH (white)
- 3 | BU (blue)
- 4 | BK (black)

Assembly



1	Operating display	green
2	Signal display	yellow
3	TEACH-IN button	
4	Mode rotary switch	
5	Laser output	

Characteristic Curve



Application



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Safety Information



Safety Information

Laser Class 1 Information
The irradiation can lead to irritation especially in a dark environment. Do not point at people!
Maintenance and repairs should only be carried out by authorized service personnel!
Attach the device so that the warning is clearly visible and readable.
Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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Teach-In

You can use the rotary switch to select the output **Q1** or **Q2** and the relevant switching threshold A or B for teaching in. The yellow LEDs indicate the current state of the selected output.

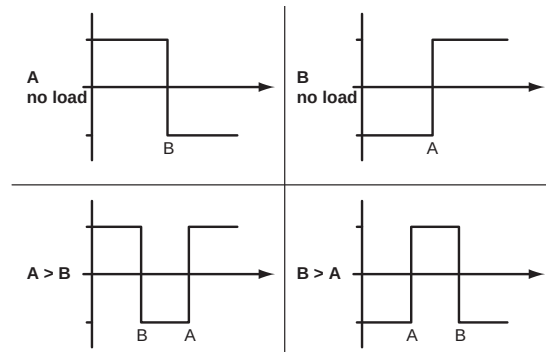
To store a switching threshold (distance measured value), press and hold the "SET" button until the yellow and green LEDs flash in phase (approx. 2 s). Teach-In starts when the "SET" button is released.

A successful Teach-In is indicated by rapidly alternating flashing (2.5 Hz) of the yellow and green LEDs.

An unsuccessful Teach-In is indicated by alternating flashing (8 Hz) of the yellow and green LEDs.

After an unsuccessful Teach-In, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

Different switching modes can be defined by teaching in the relevant distance measured values for the switching thresholds A and B:



Every taught-in switching threshold can be retaught (overwritten) by pressing the SET button again.

Pressing and holding the "SET" button for > 5 s completely deletes the taught-in value. The yellow and green LEDs go out simultaneously to indicate that this procedure has been completed.

Default setting:

In general, no switching points are set at the factory. The outputs are switched to low.

Reset to default settings:

- Set the rotary switch to the "RUN" position
- Press and hold the "SET" button until the yellow and green LEDs stop flashing in phase (approx. 10 s)
- If the green LED lights up, the procedure is complete.

Error messages:

- Short circuit: In the event of a short circuit at the sensor output, the green LED flashes with a frequency of approx. 4 Hz.
- Teach error: In the event of a teach error, the yellow and green LEDs flash alternately with a frequency of approx. 8 Hz.



Note!

The difference in the taught-in distance measured values for the switching thresholds A and B must be greater than the switching hysteresis set in the sensor.

On delivery, the switching hysteresis is 15 mm.

If the difference in the taught-in measured values is the same as or smaller than the set switching hysteresis, the sensor will visually signal an unsuccessful Teach-In. The last distance measured value that was taught in will not be adopted by the sensor.

Select a new distance measured value for switching threshold A or B with a greater difference between the switching thresholds.

Teach in this distance measured value on the sensor again.